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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/745,430

12/26/2000

Kenichi Kusaka

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04/21/2003

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EXAMINER

NGUYEN, THONG Q

ART UNIT

PAPER NUMBER

2872

DATE MAILED: 04/21/2003

12

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicant No.

09/745,430

Applicant(s)

KUSAKA, KENICHI

Examiner

Thong Q. Nguyen

Art Unit

2872

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 January 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) 3, 4, 9 and 12-24 is/are withdrawn from consideration.
- 5) ☐ Claim(s) 1 is/are allowed.
- 6) ☒ Claim(s) 1, 2, 5-8, 10, 11 and 25 is/are rejected.
- 7) ☐ Claim(s) is/are objected to.
- 8) ☐ Claim(s) are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. .
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) .
- 4) ☐ Interview Summary (PTO-413) Paper No(s). .
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: .

DETAILED ACTION

Response to Amendment

1. The present Office action is made in response to the amendment (Paper No. 11) filed on 1/22/2003.

It is noted that in the amendment, applicant has added one more claim. I.e., claim 25 into the application. As a result, the pending claims are claims 1-25 in which claims 3-4, 9 and 12-24 are non-elected claims. The newly-added claim 25 dependent upon claim 1, thus, claims 1-2, 5-8 and 10-11 are examined in this Office action.

Specification

2. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.
3. The disclosure is objected to because of the following informalities: Page 24: the description relating to the operation/function of the prism 15 as stated is not matched or unclear with those shown in figure 16A-B. Applicant should note that the prism 15 is located on the observation side and is used to combine the two line paths from the prism 12. As such it is unclear why applicant states that the prism 15 is used to separate the light. Appropriate correction is required.

Suggestions

4. The following corrections are suggested to the claim(s).

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a) In claim 5: the phrase thereof "wherein an angle made by said normal to said surface of said at least one polarizing member with said optical axis of said differential interference optical system is changed, and" (lines 21-22) should be deleted because the mentioned phrase duplicates the same as recited on lines 17-18 of the claim;

b) In claim 25: on line 7, the terms "said optical axis" should be changed to --an optical axis--. The reason of the suggestion is that the claims do not provide an antecedent basis for the optical axis.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 8 and 10 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

a) Claim 8 is rejected under 35 USC 112, first paragraph because the specification does not teach an optical system having two polarizing elements; two polarizing members and a lens system wherein at least one polarizing member has the characteristics as recited in the features thereof "wherein at least one...parallel therefrom" (lines 13-23). In particular, the specification does not disclose the use of any polarizing element which comprises both functions

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thereof "two linearly polarized components intersect with each other...is variable" (lines 14-16) and "one of said first...parallel therefrom" (lines 17-23).

b) The remaining claim is dependent upon the rejected base claim and thus inherits the deficiencies thereof.

Claim Rejections - 35 USC § 102

7. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

8. Claims 1-2, 6 and 11 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Otaki (Japanese reference No. 11-218679).

See Otaki, pages 5-6 and fig. 6.

Claim Rejections - 35 USC § 103

9. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

10. Claims 1-2, 6 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayashi (U.S. Patent No. 4,964,707, of record) in view of Otaki (Japanese reference No. 11-218679, submitted by applicant).

Hayashi discloses a differential interference microscope. In the embodiment described in columns 3-5 and shown in figure 4, the microscope comprises the following elements: 1) a light source (1), a polarizer (2) for converting a ray of light emitted from the light source into linearly polarized light, a Wollaston prism (9) for separating the linearly polarized light into two linearly polarized components which vibrate perpendicular to each other and travel at a slight separate angle wherein the prism

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possesses a position of localized fringes; a lens system having a lens element (4) for guiding polarized light to a sample (M) and a lens element (5) for guiding light from the sample to a second Wollaston prism (10) which combines the two polarized components on an identical path after passing through the lens (5); an analyzer (7) for converging light into linearly polarized light and an eyepiece lens element (8) for observing the image of the sample (M). It is noted that all of the mentioned optical elements are arranged in that order along the light path from the light source (1) to the eyepiece lens (8). The only feature missing from that embodiment is that Hayashi does not disclose that at least one Wollaston prism is able to rotate with respect to the optical axis of the microscope for the purpose of varying the distance from the prism to the position of localized fringes. However, Hayashi indeed teaches such a rotation of the prism with respect to the optical axis as can be seen in column 6 and shown in figure 6. It is noted that the rotation of the prism as stated by Hayashi will change the localized distance of the differential image. Further, the rotation of at least one prism in a microscope system is also suggested to one skilled in the art as can be seen in the system provided by Otaki. See pages 5-6 and fig. 6. Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the microscope having a transmitted illumination provided by Hayashi by rotating at least one prism as suggested by himself and Otaki for the purpose of varying the distance between the rotating prism and its localized fringed position for the purpose of improving the image quality.

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11. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hayashi in view of Otaki (Japanese reference No. 11-218679, of record) and Tabata (U.S. Patent No. 5,420,717).

Hayashi discloses a differential interference microscope. In the embodiment described in columns 3-5 and shown in figure 4, the microscope comprises the following elements: 1) a light source (1), a polarizer (2) for converting a ray of light emitted from the light source into linearly polarized light, a Wollaston prism (9) for separating the linearly polarized light into two linearly polarized components which vibrate perpendicular to each other and travel at a slight separate angle wherein the prism possesses a position of localized fringes; a lens system having a lens element (4) for guiding polarized light to a sample (M) and a lens element (5) for guiding light from the sample to a second Wollaston prism (10) which combines the two polarized components on an identical path after passing through the lens (5); an analyzer (7) for converging light into linearly polarized light and an eyepiece lens element (8) for observing the image of the sample (M). It is noted that all of the mentioned optical elements are arranged in that order along the light path from the light source (1) to the eyepiece lens (8). There are two features missing from that embodiment is that Hayashi does not disclose that at least one Wollaston prism is able to rotate with respect to the optical axis of the microscope for the purpose of varying the distance from the prism to the position of localized fringes, and the prism is able to move in a direction perpendicular to the optical axis for the purpose of adjusting the phase difference between the two components of the light beam.

Regard to the rotation of the prism used to separate the light into the two components, it is noted that Hayashi indeed teach such a rotation of the prism with respect to the optical axis as can be seen in column 6 and shown in figure 6. The rotation of the prism as stated by Hayashi will change the localized distance of the differential image. Further, the rotation of at least one prism in a microscope system is also suggested to one skilled in the art as can be seen in the system provided by Otaki. See pages 5-6 and fig. 6. Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the microscope having a transmitted illumination provided by Hayashi by rotating at least one prism as suggested by himself and Otaki for the purpose of varying the distance between the rating prism and its localized fringed position for the purpose of improving the image quality.

While the combined product provided by Hayashi and Otaki does not disclose that the prism is able to move in a direction perpendicular to the optical axis as claimed, however, such a movement of the prism is well known to one skilled in the art as can be seen in the microscope provided by Tabata. In particular, Tabata discloses the use of prism element and teaches that the elements of the prism is moved in a direction perpendicular to the optical axis for the purpose of compensating the phase changes. See column 7 and fig. 8, for example. Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the microscope having a transmitted illumination provided by Hayashi and Otaki by moving the prism in a direction perpendicular to the optical axis as suggested by Tabata for the purpose of compensating the change in phase of the two components of the light.

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12. Claims 7 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayashi (U.S. Patent No. 4,964,707, of record) in view of Otaki (Japanese reference No. 11-218679, submitted by applicant).

Hayashi discloses a differential interference microscope. In the embodiment described in columns 3-5 and shown in figure 4, the microscope comprises the following elements: 1) a light source (1), a polarizer (2) for converting a ray of light emitted from the light source into linearly polarized light, a Wollaston prism (9) for separating the linearly polarized light into two linearly polarized components which vibrate perpendicular to each other and travel at a slight separate angle wherein the prism possesses a position of localized fringes; a lens system having a lens element (4) for guiding polarized light to a sample (M) and a lens element (5) for guiding light from the sample to a second Wollaston prism (10) which combines the two polarized components on an identical path after passing through the lens (5); an analyzer (7) for converging light into linearly polarized light and an eyepiece lens element (8) for observing the image of the sample (M). It is noted that all of the mentioned optical elements are arranged in that order along the light path from the light source (1) to the eyepiece lens (8). There are only two things missing from that embodiment is that Hayashi does not disclose that at least one Wollaston prism is able to rotate with respect to the optical axis of the microscope for the purpose of varying the distance from the prism to the position of localized fringes, and the product between the thickness of the prism and the angle of rotation of the prism is smaller than a particular value.

Regard to the rotation of the prism, it is noted that Hayashi indeed teach such a rotation of the prism with respect to the optical axis as can be seen in column 6 and shown in figure 6. The rotation of the prism as stated by Hayashi will change the localized distance of the differential image. Further, the rotation of at least one prism in a microscope system is also suggested to one skilled in the art as can be seen in the system provided by Otaki. See pages 5-6 and fig. 6.

While Hayashi and Otaki do not clearly state that the product between the thickness of the prism and the rotating angle is smaller than 12 mm; however, such a feature is inherently disclosed by the structure of the system claimed. The support for that conclusion is as follow: First, it is well known that the thickness of the prism is about 1 mm or at most 2 mm (see also the present specification at pages 2-3); and second, the rotation of a prism about the optical axis of a system is relatively small; therefore, it is inherently that the product of the thickness of the prism, i.e., 1-2 mm, and the rotating angle of the prism, i.e., in the range of 10 degrees, is in the range claimed.

Thus, it would have been obvious to one skilled in the art at the time the invention was made to modify the microscope having a transmitted illumination provided by Hayashi by rotating at least one prism as suggested by himself and Otaki for the purpose of varying the distance between the rating prism and its localized fringed position for the purpose of improving the image quality.

Conclusion

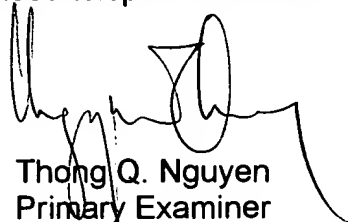
13. The additional reference is cited as of interest in that it discloses a differential interference microscope.

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14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thong Q. Nguyen whose telephone number is (703) 308-4814. The examiner can normally be reached on M-F.

The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308 0956.



Thong Q. Nguyen
Primary Examiner
Art Unit 2872

April 16, 2003